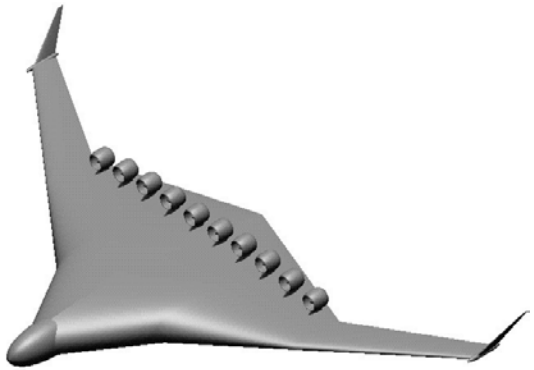
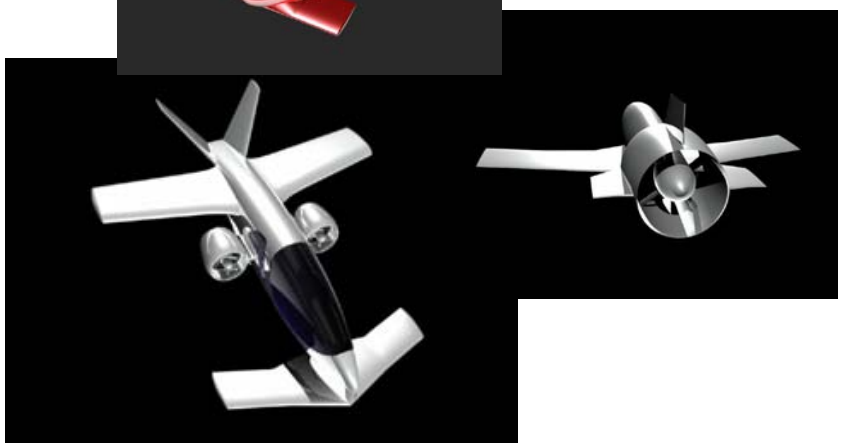
RASC



Aerospace Mobility Studies

October 2, 2001



Bob McKinley
r.e.mckinley@larc.nasa.gov

Why an Aerospace Mobility Group?

- **The underlying purpose for most aerospace vehicles is to move something from an origin to a destination.**
  - **Other purposes may be surveillance, tourism, recreation**
- **The RASC approach to mobility will include a fundamental view of each system used to accomplish a transportation mission.**
  - **Infrastructure**
  - **Vehicles**
  - **Operations**
- **The objective will be to identify capabilities that enable a superior vision of the future, requirements pursuant to reaching the capabilities, and key technologies that fulfill those requirements.**

Aerospace Mobility Studies

- Mission Group Overview
- Advanced Airspace System Concepts
- Quiet Green Transport
- Personal Air Vehicle
- Global-Orbital Transport

Mission Group Overview

- **Baseline: Today's Capabilities**
  - **Most of the trips are taken in commercial air**
  - **"Hub and spoke" is the dominant operational concept**
  - **Short trips are by ground**
  - **Long trips take a day by air**
  - **Not particularly "user friendly" or "neighborly"**
- **Vision: Air is the primary solution for high value transportation (and it's not a burden to individuals).**
- **Where is the revolution?**
  - **Exploring the limits of speed, convenience, safety and cost.**
  - **Air transport system is a "good neighbor"**
  - **Look at vehicles and infrastructure as an integrated system, with associated impacts upon the users and neighbors**

Advanced Airspace Concepts

- **Address the far-term, post-OEP issues related to the National Air Space Architecture**
  - **Non-linear, discontinuous effects of widely distributed problems whose summation can lock down the system**
- **Approach via contracted study to MIT**
  - **John Hansman and associates**
  - **Work non-linearities and ops/procedures**
  - **Model new comm/nav/surv approaches to address effects**
- **Study team**
  - **MIT, Draper Labs, Aero Engineering, LMI, Team Vision, LaRC**
  - **AvSTAR/VAM, ISAT, AvSP, & Blueprint will leverage activity**
- **Groundrules & Assumptions**
  - **There's nothing new under the sun (many ideas, no content)**
  - **Move towards next level of detail to substantiate ideas**
  - **Eventually, synthesize into viable post-OEP architecture**

Quiet-Green Transport

- **For FY02, continue FY01 QGT track**
  - **Aircraft noise inside airport fence, no bad emissions**
  - **Complete Concepts B & C**
- **Identify capabilities and requirements for viable zero-emission transports**
  - **Propulsion & airframe**
- **Study Team**
  - **GRC, LaRC**
  - **TCAT, RAC, UEET, and QAT will leverage activities**
- **Groundrules & Assumptions**
  - **Same as FY01 work**

Personal Air Vehicle Exploration

- **For FY02, continue FY01 PAV track**
  - **Address capabilities and requirements ID'd in FY01 work**
  - **Define integrated vehicles, technologies, and systems that can fulfill mission**
- **Study Approach**
  - **Delve into detailed concept and technology analysis and evaluations of new mobility concepts**
  - **In-depth concept creation & system analyses, numerical simulations, small wind-tunnel tests, & powered models**
- **Study Team**
  - **GRC, GM, Ford, Boeing, Mdot Aerospace, Cal Poly, Georgia Tech, LaRC**
  - **SATS/uSATS, AvSTAR/VAM, & ISAT will leverage activities**
- **Groundrules & Assumptions**
  - **Same as FY01 work**

Global-Orbital Transport

- **For FY02, continue FY01 GOT track**
  - **Address capabilities and requirements ID'd in FY01 work**
  - **Define integrated vehicles, technologies, and systems that can fulfill mission**
- **Study Approach**
  - **Update Global Transport, 2STO, 3STO**
  - **Define cost advantages of dual-use vehicle**
  - **Analyze to define environmental impact**
  - **Develop technology sensitivities**
- **Study Team**
  - **Code R, Code M**
- **Groundrules & Assumptions**
  - **Same as FY01**

Summary

- **Issues and feedback on direction**